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ABSTRACT

A modular system for undergraduate programs was implemented in three degree programs at Napier University in Scotland. This paper describes the degree course structure prior to 1992-93 and factors leading to change, including university response to government policy encouraging wider access to higher education. A rationale for modularization is presented, and development of the modular scheme is detailed, emphasizing the consultation, approval, quality control, and problem-solving processes. The modularization was designed to permit wider access, accelerated study, greater flexibility, and student choice; permit best use of available accommodations; allow student numbers to increase in line with government guidelines; and result in a reduction in resource requirements via the development of common curricula and assessment and a reduction in course administration. Students have enjoyed the opportunity to select free choice electives in fields totally different from those of their chosen program of study and prefer the assessment strategy which removes hurdles to entry to examinations and allows good marks in some assignments to compensate for poor marks in others. Academic staff have tended to experience increased workloads in the short term but it is anticipated that this will decrease. No significant difference in the performance of accounting students was exhibited after implementation of the modularization. (Contains 11 references.) (JDD)

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GOING MODULAR - FOR BETTER OR WORSE?

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Jean Endo
Editor
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GOING MODULAR - FOR BETTER OR WORSE?

AN INITIAL STUDY OF THE EFFECT OF MODULARISATION ON STUDENT PERFORMANCE

What are the effects of modularisation on student performance? This paper addresses that issue and asks the question - are the best interests of students being served by a modular approach? The impact of the introduction of a modular system for undergraduate programmes on the performance of students in three degree programmes in a Scottish University is investigated and student performance in coursework and degree examinations, before and after modularisation, is compared and analysed for statistical significance. The Authors give their first reactions and suggest solutions to identified problems.

1. INTRODUCTION

1.1 Napier University

Napier first opened in 1964 as Napier Technical College and today, as Napier University, is one of the largest Higher Education institutions in Scotland, enrolling 9,300 students, of whom 5,800 are involved in full-time study, and offering a range of courses with a vocational bias.

1.2 Degree Course Structures prior to Session 1992-93

In 1991 Napier offered 111 courses - 36 undergraduate degree programmes, 28 Postgraduate courses and 47 Diploma, Certificate and Professional courses.

Within the undergraduate programmes there was a wide variety of structures, particularly in the full-time Honours programmes, with the length of the period of study ranging from 10.5 Academic Terms to 12 Academic Terms, some programmes with placement, some without, and the length of the placement periods varying between one, one and a half, two and three Academic Terms.

The structure of these degree programmes had been influenced by a number of factors including the views of the Subject Boards and the regulations of the Council for National Academic Awards (CNAA) - the validating body prior to Napier achieving full accredited status in 1988 (J E McLachlan and V Wood: 1993); the views of the different course teams and the requirements of the Professional Bodies. CNAA had insisted on well defined course coherence and academic rigour and this, combined with the strengths of the individual course team, when each new course had been developed, had resulted in tightly structured degree programmes with little or no

opportunity for flexibility. While there had been an emphasis on interdisciplinarity there was very little use of common elements across courses except in the Business School where a common first year curriculum underpinning four undergraduate programmes had first been introduced in 1987 (J E McLachlan and V Wood: 1992). This lack of commonality across courses limited student flexibility and hindered wider access, to which Napier was committed, and ways of increasing both of these were being sought.

2. FACTORS LEADING TO CHANGE

2.1 Background to Modularisation

The concept of 'going modular' had been considered at Napier as early as 1985 but had not been actively pursued at that time - a time when Napier was already coping with the major implications of transferring to the Central Institution sector; being funded directly by the Scottish Office and facing a period of major expansion - both in course provision and in student numbers.

Many of the English Polytechnics had opted for modular course programmes - similar to those operated by the old Universities - and reports of their experiences were becoming increasingly available (Watson D: 1989)(Southampton IHE: 1990). Proponents of modularisation pointed to increased flexibility, wider access, resource savings and popularity with students as being just some of the benefits to be derived from modularising while those who were less enthusiastic questioned the effects that modularisation would have on academic standards, the learning experience and the value of the qualification obtained in terms of coherence of study.

In consultation with some of the Institutions operating modular programmes the CNAA published two discussion papers in 1989 and 1990 which focused on the practicalities of going modular and the potential benefits and possible dangers of such schemes.

2.2 Legislation

The UK government is committed to a policy of wider access and an increased participation rate in Higher Education. These policies were affirmed in the Government White Paper published in 1987, 'Higher Education - Meeting the Challenge', and the 1991 White Paper, 'Higher Education - A New Framework'. This commitment was underlined by the Government's stated aim to increase participation in Higher Education in Scotland to 40% by the Year 2000.

The Government's policies in relation to wider access positively encouraged Higher Education institutions to increase provision of degree courses and two-year full-time diplomas with a vocational emphasis; to increase opportunities for flexibility via accelerated courses, multiple entry/exit points, part-time study and Credit Accumulation and Transfer schemes (CATS) and to develop courses that would meet the needs of the economy, employers and students with varying needs and backgrounds.

2.3 Napier University's Response to Government Policy

Napier has long been committed to the tenets of wider access (McLachlan and Wood: 1994) - its student intake, which is drawn from all walks of life and covers a wide age range, includes school leavers aged 17 and 18 with traditional entry qualifications;

graduates looking for postgraduate qualifications; employees looking to improve their chances of promotion and gain professional qualifications; mature students and overseas students.

In response to the Government's support of CATS Napier adopted the Scottish Credit Accumulation and Transfer Scheme (SCOTCAT) developed by CNAA in 1989, and in line with the CATS regulations for England and Wales. The SCOTCAT system was based on a credit points system awarded for units of study and/or prior experiential learning, which could be accumulated over a period of time by different modes of study and which would lead to the award of designated qualifications. Certain courses at Napier which involved periods of work placement had already begun to establish learning contracts between the student and the employer whereby the learning achieved by the student via work experience could be evaluated and assessed. As a result the SCOTCAT scheme was seen to be a possible model for a modular course structure at Napier.

3. RATIONALE FOR MODULARISATION

While Napier was committed to widening access, increasing student numbers and providing more flexible programmes of study it was constrained by limited accommodation and the resource constraints which would result from the new funding methodology to be introduced via the Higher Education (Scotland) Act 1992 and the establishment of the Scottish Higher Education Funding Council. This new formula for funding Higher Education involved partial funding related to research ratings; partial funding related to student numbers and an increased percentage of funding having to be generated by the Institutions themselves.

It was suggested that modularisation would

(a) permit wider access, accelerated study, greater flexibility and student choice

(b) permit best use of available accommodation

(c) allow student numbers to increase in line with government guidelines

(d) result in a reduction in resource requirements via the development of common curricula and assessment and a reduction in course administration.

This rationale for the introduction of a formal modularisation scheme was presented to the Academic Board in May 1989 and the Board agreed that further consideration should be given to the development of a modular scheme laying the responsibility for heading that development with the Chairman of the University's Academic Standards Committee. Representatives of the Academic Standards Committee visited five English institutions and several Institutions in the United States to learn at first hand the complexities of introducing a modular scheme and to view different modular structures in operation and a formal Modularisation Working Party was established in June 1990 as a sub-committee of the Academic Standards Committee.

4. DEVELOPMENT OF THE MODULAR SCHEME

4.1 Working Party on Modularisation

The Working Party on Modularisation was led by the Chairman of the Academic Standards Committee with representatives of the Deans of Faculty, Heads of Department and Course Leaders in membership. From early in its deliberations the Working Party had insisted that the scheme must:

. be consistent with the University's mission statement

. be introduced across all Faculties simultaneously

- maintain academic standards
- maintain the possibility of providing named routes through degree programmes
- not conflict with the requirements of the professional bodies
- increase student choice in relation to their programme of study
- be compatible with the SCOTCAT system.

For the scheme to be successful and to gain maximum benefits it was agreed that it would have to apply to all undergraduate degrees - the structures of which would have to be critically appraised and reviewed. In addition it was recommended that, where possible, there should be a rationalisation of course and module provision and that course teams should consider implications for articulation with the Scottish Vocational Education Council's (SCOTVEC) Certificate and Diploma provision.

4.2 Consultation Process

Throughout the development process academic staff were invited to comment on draft proposals as they emerged and Heads of Department were given the responsibility for discussing the proposals with their departmental staff. In addition there were open exchanges of views at formal committee meetings. There was some resistance to the idea of modularisation and responses to a discussion paper submitted to Faculty Boards in January 1991 included expressions of concern over the proposed speed of implementation of the scheme - it was proposed that the scheme would be operational by September 1992 - and the view that the stated objectives of modularisation were, and could be, met within the existing structures. In addition fears were expressed that modularisation would in fact overload staff - both in terms of administration and assessment - and would reduce the time available for research, which was already

insufficient. However, despite these anxieties and concerns, the Faculty Boards supported in principle the proposal to modularise the University undergraduate degree programmes.

4.3 **Approval of the Modular Scheme**

In March 1991 the Academic Board approved the proposed scheme for modularisation, subject to minor amendments, and the implementation date of September 1992. However, it was agreed that only the first years of the new modular degree programmes would be introduced for that date with subsequent years being introduced on a rolling programme while the non-modular years of the degrees rolled out. In addition it was agreed that the modular courses would operate on a two semester basis while the non-modular courses would continue to operate on a three term basis. So far as the ownership of modules was concerned it was agreed that modules would be owned by the parent Department, although they could be taught by another Department.

The scheme approved was based on a two-semester academic year, with a one-week intersemester break, and on a modular structure based on modules which carried credit ratings ranging from 8-24, with students required to accumulate 120 credits for a Napier Certificate in Higher Education; 240 credits for a Napier Diploma in Higher Education; 360 credits for a Degree and 480 credits for an Honours Degree. In addtion 2/15th of the credits obtained in each year of study would be obtained via free choice elective modules. To successfully complete any one module a student would be reuqired to obtain a minimum module mark of 40% calculated across the weighted assessments for that module.

4.4 Progression Towards Modularisation

The 18 months following the approval of the proposed modular scheme by the Academic Board involved extensive staff involvement in the modularisation process

- academic staff were required to examine their degree course structures, paying particular attention to the Honours learning experience for the students, and to come forward with proposals for a modular course structure for their course

- academic and support staff were involved in the development of procedures for administering the new modular structure not least of which involved the development of a computerised Module Course Management System (MCMS) which was seen to be a vital pre-requisite to the successful management of the scheme

- members of the Modularisation Working Party - now a Sub-Committee - and the Academic Standards Committee were involved in the further development and refinement of the scheme and in a public relations role promoting and explaining the scheme to the wider academic community, analysing envisaged problems and identifying ways of remedying them.

Open meetings were held on the three main University Campuses in June 1991 to provide an open forum for discussion and Sub-Committees of the Academic Standards Committee were established to concentrate on issues relating to Timetabling and the development of the MCMS. The Business School set up its own Modularisation Sub-Committee which met on several occasions between March and September 1991 to address the modularisation of its courses and to bring specific concerns to the attention

of the Academic Standards Committee. The Chairman of the Academic Standards Committee attended Faculty Advisory Meetings in November 1991 in an attempt to resolve any outstanding issues.

4.5 Quality Control of Modules and Courses

One of the benefits of adopting a modular scheme was seen to be the opportunity to tighten quality control of courses by means of carrying out academic scrutinies of the individual course components - the modules.

A series of Departmental Scrutiny events, each lasting half a day, was arranged to allow each Department's proposed portfolio of modules to be scrutinised in conjunction with its proposals for the quality control management of its modules. Originally these scrutinies were to take place between November 1991 and February 1992 but an extended period of industrial action, which led to academic staff confining their duties to those related to the teaching of students, resulted in these scrutinies being postponed and taking place between January and March 1992. The only Department to adhere to the original scrutiny date of 28 November 1991 was the Department of Accounting and Law in the Business School.

Prior to the scrutinies taking place modules were sent to external specialists in appropriate disciplines for verification of their suitability in terms of academic level and content, methods of assessment and the teaching/learning programme.

Six weeks after the scrutiny events each Department underwent a one-day Validation at which external experts - both academic and professional - were present, with a view to validating the Department's portfolio of modules.

Concern had been expressed during the Scrutiny events that, because of time constraints now imposed, there was no opportunity for Departments to comment on the modular course structures proposed in other Faculties. In an attempt to overcome these concerns all of the University's proposed course structures were circulated to each Department in February 1992 and Departments were invited to submit any comments to the Academic Standards Committee prior to courses being confirmed.

The next step was to validate the course structures in which these modules were located and this was dealt with on a Faculty basis - each Faculty undergoing a Confirmation of Courses Validation lasting 1.5 days. The purpose of these events was to examine the new modular course structures in detail paying attention to the underpinning of modules in later years; the breadth of the learning experience; the students' workload - in terms of course content and assessment - and the course assessment, progression and award of qualification regulations.

All of the undergraduate degrees in the Business School were successfully confirmed on 19 June 1992.

4.6 MCMS

The development of the MCMS was seen as crucial to the implementation of the modular scheme and an assurance was given to the academic staff that enough of the

system, which would be module based, would be operational by September 1992 to support the first year of modularisation with development work continuing thereafter. Unfortunately, due to the timescale agreed for the introduction of the first year of modularisation, there was no opportunity to operate a pilot scheme to test the MCMS. Because of this the Business School continued to maintain a parallel system to record the students' assessment results in case any major problems emerged with the MCMS during its first year of operation.

5. STUDENT PERFORMANCE

Students very quickly grasped the implications of an assessment strategy that allowed a module pass mark of 40% regardless of the level of the actual marks achieved in any individual piece of work or examination. Depending on the weightings applied to each of the items of assessment for a module they could identify whether or not they had done well enough in early assignments to allow them to put less effort into an assignment towards the end of the module or to opt out of one assignment all together. In some cases they miscalculated! The performance of students in the first year of the BA Accounting Degree in the three first diet assessments before and after modularisation has been analysed and compared and tested for statistical significance. The results are shown in Figure 1.

Figure 1. Comparison of Student Pass Rates in the Three Assessments Before and After Modularisation Across The BA Accounting Degree

BA Accounting

Assessment		Total No of Stdnts	Total Passed 1st Diet	% Pass Rate
Pre-Modularisation	1	56	43	77%
	2	45	30	67%
	3	62	46	74%
Three Assessment Figure		163	119	73%
Post Modularisation	1	51	37	73%
	2	51	27	53%
	3	38	32	84%
Three Assessment Figure		140	96	69%
Significance of Proportions Comparing Pre and Post Modularisation Assessments Z Statistic				0.85
Significant at 5% level				NO

6. APPRAISAL OF THE MODULAR SCHEME TO DATE

We have now completed three semesters in the modular scheme with, currently, first and second years of the modularised degree programmes in operation. There have been several teething problems which have been dealt with as and when they arose and almost all could be attributed to the speed at which the modular system was introduced and problems with poor communication between staff and the culture shock of moving to a system requiring a different attitude to assessment and a disciplined approach to keeping to the timetables for teaching and assessment required by a modular course management system.

Particular problems arose in the following areas:

(a) **Re-assessment policy** - particularly where students were carrying a failure from their previous year of study - and the question of whether or not good marks achieved in some assignments should be carried forward and weighted with any subsequent resit marks.

(b) **Allocation of electives** - the system of allocating electives involving the selection by students of four pairs of elective choices led to some students not being allocated their first or second choice electives. In addition, in the first semester of the second year of modularisation, there were insufficient module places available in the first instance to meet the needs of the first and second year students.

(c) **Communication of re-assessment requirements** - the responsibility for communicating the re-assessment requirements for individual students lay with

the Module Leaders whereas, previously, this area of responsibility had lain with Course Leaders. Module Leaders had not grasped the implications of this shift in responsibility and this led to some first year students remaining unaware of what they were required to do in terms of re-assessment for progression to second year until late in the summer of 1993.

(d) **Communication** - communication of amendments to the original modular regulations failed to reach the staff 'at the chalk face' in a number of instances. Too much reliance was placed on each level of management passing the information to the next level in the chain instead of those actually operating the system at the staff/student interface being contacted directly..

(e) **Culture shock** - staff and students found it difficult to adjust to an entirely new culture where the student was ultimately responsible for his/her own programme of study and where staff were required to adhere to the strict timetable required if the MCMS was to 'manage' the modular process. In a number of instances the timetable slipped with implications for all concerned.

(f) **Dual System** - the operation of a two semester, modular system for undergraduate degrees in tandem with a three term non-modular system for all other courses caused problems in terms of timetabling and staff workloads - particularly when it came to marking of assessments.

(g) **Computerisation** - a number of problems emerged in respect of the way in which certain aspects of the MCMS had been programmed. In addition, at

peak data inputting times such as prior to meetings of the Departmental and Course Boards of Examiners, unacceptable waiting times were experienced by staff attempting to input the data.

7. STEPS TAKEN TO RESOLVE PROBLEMS IDENTIFIED

In the Autumn of 1993 it was recognised that there was a need for one person to oversee the modular system and to identify possible problems in advance and to find solutions to them which were acceptable to all parties involved.

One of the authors accepted a three-month part-time secondment during the Autumn term to act as a modular 'troubleshooter'. As a result, and following consultation with the Modularisation Sub-Committee, the Academic Standards Committee, academic staff in the four Faculties and the administrative staff responsible for managing the system, a number of changes to existing regulations and new procedures were agreed.

These included:

(a) **Re-assessment Policy** - a shift to a simplified re-assessment policy utilising pre-determined re-assessment instruments and 'stand alone' re-assessment marks; a fixed re-assessment diet in August/September each year for remedying failures incurred in that year of study; the opportunity for students carrying a failed core/option module into their subsequent year of study to be re-assessed in that failure at the first available opportunity.

(b) **Allocation of Electives** - a new system for choosing electives via the selection of six choices in rank order and the devolvement of responsibility for elective clearing to the Faculties.

(c) **Communication of Re-Assessment Requirements** - responsibility for communicating re-assessment requirements to students shifted back to course leaders as a paper exercise for one year only to be followed by the production of transcripts of students marks, including details of their re-assessment requirements, by the MCMS.

(d) **Communication** - the Chairman of the Academic Standards Committee and representatives of the major 'players' in the management of the system, ie the Computer Unit; the Quality Assurance Unit and the Academic Registry, held on-site open discussions with the academic staff to discuss concerns and to advise on proposed action to resolve problems. In addition specific mailing lists targeting Course Leaders and Module Leaders were established to ensure that the right information got to the right people.

(e) **Culture Shock** - it is hoped that as staff become familiar with the new modular system culture shock problems will diminish.

(f) **Dual System** - so far as timetabling problems were concerned, with effect from September 1993 all courses in the University have been timetabled on a semester basis and so far as the workload for staff in terms of assessments is

concerned, Module Leaders were urged to reconsider the assessment strategy for their modules to avoid over assessment at the end of each semester.

(g) **Computerisation** - new software has been written to bring the information produced more into line with the requirements of the academic staff and additional memory has been installed to reduce waiting times when inputting data. In addition the responsibility for such inputting in a number of areas (option choices, elective choices, updating module class lists, elective clearing) has been devolved to Faculties to the staff most closely involved with the students and the academic staff.

8. CONCLUSION

The introduction of the modular system has been a learning experience for the staff and students alike and it has been their goodwill and their desire that the system should be successful that has made it work despite the difficulties experienced.

Students have enjoyed the opportunity to select free choice electives in fields totally different to those of their chosen programme of study and prefer the assessment strategy which removes hurdles to entry to examinations and allows good marks in some assignments to compensate for poor marks in others.

Academic staff have found it difficult to come to terms with the concept that a student no longer 'fails' in an assignment only in a module if they fail to achieve 40% overall. In addition the exigencies of teaching on modular and non-modular courses has tended to increase workloads in the short term but it is anticipated that these

problems will decrease as modularisation progresses. Similarly as we become more accustomed to the new system and the requirements of the MCMS problems with failed deadlines should disappear.

So far as student performance is concerned in the BA Accounting there is no significant statistical difference between performance in terms of percentage passes in the first diet although there are annual variations. This will be further investigated in the other degrees as time goes on.

In an attempt to continue to improve the present system and to develop it further in the future a Module Manager is being appointed to take responsibility for the management of the modular system across the University and for ensuring its smooth and efficient operation in the years to come.

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